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Vol. III

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BULLETIN

OF THE

Chicago Academy of Sciences

Annual Reports for the Year 1910

Winter and Spring Announcements



CHICAGO
Published by the Academy
February, 1911

**PUBLICATIONS ISSUED BY THE CHICAGO ACADEMY
OF SCIENCE.**

I. By the ACADEMY:

Early Proceedings, Vol. I. Out of print. Pages 1-48.

Transactions, Vol. I. Out of print. Contains:

ART. I. Description of Fossils from the Palaeozoic Rocks of the Western States, with illustrations. By Professor J. H. McCleshey.

ART. II. On the Climate of the Country Bordering Upon the Great North American Lakes. By Dr. I. A. Lapham.

ART. III. Remarks on the Geology of the Valley of the Mackenzie River, with figures and descriptions of Fossils from that region, in the Museum of the Smithsonian Institution, chiefly collected by the late Robert Kennicott, Esq. By F. B. Meek.

ART. IV. Descriptions of New Subcarboniferous and Coal Measure Fossils, collected upon the Geological Survey of Iowa, together with a notice of new generic character observed in two species of Brachiopods. By Dr. C. A. White and O. H. St. John.

ART. V. Illustrations of North American Birds in the Museum of The Chicago Academy of Sciences. By Dr. William Stimpson.

ART. VI. Biography of Robert Kennicott. By a Committee of The Academy, appointed at the meeting of Nov. 13, 1866.

ART. VII. On the antiquity of Man in North America. By J. W. Foster, LL.D.

ART. VIII. Descriptions of Certain Stone and Copper Implements Used by the Mound Builders. By J. W. Foster, LL.D.

ART. IX. List of Birds of Alaska, with Biographical Notes. By William H. Dall and H. M. Bannister.

ART. X. On additions to the Bird-Fauna of North America, made by the Scientific Corps of the Russo-American Telegraph Expedition. By S. F. Baird.

ART. XI. A Preliminary List of the Butterflies of Iowa. By Samuel H. Scudder.

Transactions, Vol. II. Out of print. Contains:

ART. I. The North American Lakes Considered as Chronometers of Post-Glacial Time. By Edmund Andrews, A.M., M.D.

Bulletins, Volume I.

No. 1. Glacial Marking of Unusual Forms in the Laurentian Hills. By Edmund Andrews, M.D., LL.D. Price, 25 cents.

No. II. Observations of Fluvial Deposits in Peoria Lake, Illinois. By Rev. Joseph D. Wilson. Price, 25 cents.

No. III. List of Batrachia and Reptilia of Illinois. By N. S. Davis, Jr., and F. L. Rice. Price, 25 cents.

No. IV. Report of the Committee on the Microscopic Organisms in the Boulder Clays of Chicago and Vicinity. By H. A. Johnson, M.D., and B. W. Thomas, F.R.M.S., Committee. Price, 25 cents.

No. V. The Northern Pitcher-Plant, or the Side-Saddle Flower, *Sarracenia purpurea*, L. By William K. Higley. Price, 25 cents.

No. VI. Boulder Clays. On the Microscopic Structure of Certain Boulder Clays and the Organisms Contained in Them. By Dr. George M. Dawson, D.Sc., F.G.S., etc. Price, 25 cents.



MATTHEW LAFLIN MEMORIAL BUILDING—THE CHICAGO ACADEMY OF SCIENCES

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THE CHICAGO ACADEMY OF SCIENCES

OFFICERS

Dr. Thomas C. Chamberlin.....	President
Mr. Albert L. Stevenson.....	First Vice-President
Dr. Ulysses S. Grant.....	Second Vice-President
Dr. Wallace W. Atwood.....	Secretary

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EX-OFFICIO

Dr. Thomas C. Chamberlin.....	President of the Academy
Mr. A. L. Stevenson.....	First Vice-President
Dr. Ulysses S. Grant.....	Second Vice-President
Mr. Ira J. Geer.....	Acting President, Board of Trustees

STAFF OF THE MUSEUM

Mr. Frank C. Baker.....	Curator
Mr. Frank M. Woodruff.....	Taxidermist
Miss Mellie G. Bunnell.....	Office Assistant
Mr. Emil Youngren.....	Museum Attendant

HONORARY CURATORS

Dr. Thomas C. Chamberlin.....	General Geology
Dr. Stuart Weller.....	Paleontology
Dr. Oliver C. Farrington.....	Mineralogy
Prof. E. J. Hill.....	Botany

Miss Mary A. Hardman.... Assistant Secretary of the Academy

REPORT FROM THE BOARD OF TRUSTEES COVER-
ING RECEIPTS AND DISBURSEMENTS
FOR THE YEAR 1910.

The following report was received from Mr. Ira J. Geer,
Vice-President of the Board of Trustees:

RECEIPTS

January	1,266.69	
February	1,383.80	
March	1,483.21	
April	984.41	
May	947.01	
June	1,222.84	
July	1,545.66	
August	1,474.72	
September	874.24	
October	355.99	
November	930.48	
December	2,334.48	14,803.53
		\$16,802.93

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DISBURSEMENTS

January	55.18	
February	931.63	
March	997.42	
April	2,149.19	
May	1,023.98	
June	953.00	
July	1,434.07	
August	304.19	
September	990.90	
October	707.50	
November	1,134.97	
December	1,772.08	12,454.11
December 31, Balance		4,348.82
		\$16,802.93
January 1, 1910, Balance		\$ 1,999.40

RECEIPTS

Lincoln Park Commissioners	5,000.00	
Austin Property Rental Account, (13 months)	6,281.98	
Interest	3,162.66	
Membership Dues	332.00	
Publications	26.89	14,803.53
		\$16,802.93

DISBURSEMENTS

Austin Property Rental per cent, expenses and commissions, (13 months). Of this amount \$544.65 are taxes for 1909.....	2,876.37	
Museum	367.22	
Library	234.60	
Furniture and Fixtures	68.73	
Salaries	6,835.00	
General Expense	455.34	
Publications	246.30	
Photographic Supplies	56.20	
Printing and Stationery	111.00	
Educational Expense	505.35	
Insurance	590.00	
Field Expense	88.00	
Petty Cash, (this amount is kept at office of Chicago Academy of Sciences).....	20.00	12,454.11
December 31, 1910, Balance		4,348.82
		\$16,802.93
Receipts	\$14,803.53	
Disbursements	12,454.11	
Net Income		\$ 2,349.42

(Signed) H. S. HENSCHEN,

Treasurer of the Board of Trustees of the Chicago Academy of Sciences

ANNUAL REPORT OF THE SECRETARY FOR THE
YEAR 1910.*To the Members of the Chicago Academy of Sciences:*

During the past year the work and the influence of the Academy have become more strongly educational. The scientific collections and exhibitions in the Museum are carefully maintained and will always be available for specialists to study, but the Museum is rapidly taking on a distinctly educational policy and the exhibits are being appropriately altered or replaced.

The loaning of museum material to the schools has continued; lecture courses or lessons have been offered to the children who have come as delegates from their respective school rooms; several illustrated lectures have been given at the schools; instructional courses open to the teachers of nature-study have been offered and university-credit courses have been conducted for those wishing to systematically pursue courses of instruction. Specific reports on each of these several lines of work will be given later in this report.

It is evident both from the work of the Museum and of the instructional courses given in co-operation with the work of the Museum, that the Academy is rapidly assuming a conspicuous place among the educational institutions of the city. The expressions of appreciation which have come to us from the Superintendent and District Superintendents of the public schools have been most encouraging. The expressions of appreciation which reach us from the principals and teachers more immediately engaged in the educational work of the North Side, are enthusiastic in praise and appreciation of the influence which the Academy is having.

But the opportunities for the Academy lie far beyond anything which we have yet realized. The North Side of the city is distinctly lacking in any public institution which is actively assisting in the educational work of the schools and offering instructional courses for adults. The work of the Academy should be consistently restricted to the utilization of the scientific data and material in educational work, but the opportunities within that field are among the most attractive that are open to any educational workers.

Following a report on the various lines of work which have been conducted by the Academy, certain conclusions will be drawn and suggestions made for the broader development of the institution.

MUSEUM LOAN COLLECTIONS.

Ninety loan collections are now available for use in the schools. Thirty-seven schools have made somewhat systematic use of these collections, and during the year one hundred sixty-nine such loans have been made. Through the use of these collections 1,440 museum specimens have been loaned to the schools. In connection with this branch of the work it must be remembered that the teachers wishing to borrow collections from the Museum must either call personally or send pupils with a written order for such collections. This method usually necessitates certain expense on the part of the teacher or pupils, and it is not as convenient a way as might be desired for the schools. In other cities where similar material is used in educational work, provision has been made for the delivery of loan collections at the schools, and with that method requests may either be forwarded by mail or by telephone to the Museum or distributing center from which these collections are issued. The Academy is making a start in this line of work. It is illustrating to the people of Chicago the value of such material and the teachers of the North Side schools have demonstrated their desire for such material for their class-room instruction.

LOAN COLLECTIONS ISSUED TO SCHOOLS DURING THE YEAR 1910.

School Using Collections.	No. of Colls.	No. of Specs.		
Adams	3	52	Linne	1 6
Alcott	6	37	Manierre	7 34
Arnold	4	28	McKinley High	3 31
Belding	5	26	Montefiore	1 9
Brainerd	2	12	Morris	11 79
Burley	1	6	Nettlehorst	7 41
Chase	1	1	Newberry	1 6
Cleveland	1	7	Nobel	2 16
Drummond	3	14	Parker, Francis	3 20
Franklin	8	55	Phillips High	2 32
Grant	2	9	Prescott	3 11
Headley	8	71	Schiller	9 87
Jahn	6	82	Schneider	8 43
Jenner	2	12	Sheldon	1 36
Kinzer	5	111	Thorp, Ole A.	13 130
Kosciuszko	6	47	Tuley High	2 32
Lake View Branch H. S.	9	82	Trumbull	10 49
Langland	8	81	University of Chicago.	1
Lincoln	4	36		
			Total, 37 Schools...	169 1,440

WHEN THE LOAN COLLECTIONS WERE USED.

Month.	No.		
January	15	September	12
February	18	October	25
March	21	November	12
April	18	December	11
May	29		
June	8		169

CHILDREN'S COURSES.

During the year, three courses of six lessons each in nature-study work have been offered. This work has been conducted by Dr. H. S. Pepoon. The children who enter these courses are appointed by their respective rooms as delegates, and the plan which was introduced last year has continued so that these delegates report as fully as they can to their respective classes the work which has been offered to them at the Academy. This proves to be a very effective method of introducing new material into nature-study lessons at the schools. The child making the report has a special opportunity to present to his, or her, classmates something which is new and fresh, and the attention which the child-delegate receives is often much better than the teacher could expect to have.

In the spring course, there was a total attendance of two hundred thirty children, or, an average attendance of forty-six at each lesson. The spring course, however, was not satisfactorily announced in the schools. During the fall, the demand for such work was so great that one course was offered for delegates from the fifth and sixth grades, and another course for the delegates from the seventh and eighth grades. The total attendance from the seventh and eighth grades was seven hundred forty-five, or an average attendance at each lesson of one hundred twenty-four. The total attendance from the fifth and sixth grades was eight hundred eighty, or an average attendance of one hundred forty-six. There is no doubt but that this work with the children, under Dr. Pepoon's leadership, has proven to be most successful, and in this we have opened up a field of direct usefulness to the North Side people. We are happily located for convening young people, and it is most gratifying to see the interest in truly scientific work, such as Dr. Pepoon is offering to these young people, grow from year to year. The only criticism which we have received regarding this phase of our work is that the opportunity of attending these classes is

limited to so few of the children. It is undoubtedly true that if we had additional facilities and funds for the support of this work we could add greatly to our usefulness and effectiveness among the children of the North Side.

SCHOOLS REPRESENTED IN THE YOUNG PEOPLE'S NATURE-STUDY
COURSES BY DELEGATES.

Agassiz,	Langland,
Alcott,	Libby,
Arnold,	McPherson,
Audubon,	Mulligan,
Bancroft,	Nettlehorst,
Brentano,	Newberry,
Burley,	Prescott,
Coonley,	Ravenswood,
Franklin,	Schneider,
Goethe,	Sheldon,
Greeley,	Stanley,
Hamilton,	Stewart,
Hawthorne,	Thorp, Ole A.,
Headley,	Trumbull,
Jahn,	North Division H. S.,
Kinzie,	Lane Tech.,
Kosciuszko,	Total, 33.

CLASSES VISITING AT THE MUSEUM.

It is impossible with our present arrangement to know how many teachers bring classes to the Museum, for it is the exception for the teachers to register at the office or for the attendants at the Museum to get a record of such visitors; but we have a record of eighteen classes that have visited the Museum with a teacher. The total number of children who are known to have come in this way with an instructor, is 3,173. While most of these classes came from the schools of the North or North-west side of the city, it is interesting to note that some of the visiting classes came from other portions of the city. One such class came from the University of Chicago, another from the La Grange High School, and from the list which follows it is clear that this influence of the Academy is felt in the private schools, including certain parochial schools as well as some of the public schools of the city.

LECTURES GIVEN AT THE SCHOOLS.

Thirteen lectures or informal talks have been given by different members of the Academy staff at the public schools during the past year. Mr. Baker has done most of this work, although Mr. Baer, who was connected with the Academy during the early part of the year, and Mr. Youngren, who is now on the staff in the Museum, have assisted, and Miss Hardman has begun this type of work for the Academy in connection with her duties as Assistant Secretary. The total number of people thus addressed is about five thousand.

The demand for such talks, or lectures, especially if illustrated by material from the Academy, is much greater than we can supply without unduly interrupting the work of the building. It is anticipated that the Assistant Secretary may find more time for such work, but it often proves a serious interruption to the Museum work to have Mr. Baker, Mr. Woodruff or Mr. Youngren away from the building.

Closely associated with this phase of our work is the visiting of the nature-study lessons given by the teachers, sometimes with Academy material which they have borrowed, but more often struggling to present their nature-study lessons without such material. From this personal contact with the school work Miss Hardman has been able to become of more assistance to the teachers, to become better acquainted and to make important suggestions in the development of our work in co-operation with the schools.

RECORD OF LECTURES GIVEN AT SCHOOLS DURING YEAR OF 1910.

Date	School	Lecturer	Grades	No. Present
March 8	Kinzie	Mr. Baker	All	100
April 20	Schneider	Mr. Baker	All	500
April 22	Chalmers	Mr. Baker	5 and 6	200
May 6	Chalmers	Mr. Baker	4 and 5	200
May	Biological Rd. Table	Mr. Baker		10
June 3	Bergen Hall	Mr. Baer		300
June 17	Jenner	Mr. Youngren	5, 6, 7, 8	450
Sept. 30	Alcott	Mr. Baker	6, 7, 8	300
Oct. 7	Alcott	Mr. Baker	3, 4, 5	300
Nov. 17	Kinzie	Mr. Baker	Mixed	125
Dec. 2	Lincoln	Miss Hardman	7, 8	200
Dec. 5	Lane Tech.	Mr. Baker	Pub. & Studts.	400

Total, 3,085

NATURE STUDY COURSES FOR TEACHERS.

The Academy has undertaken, during the past three months, to offer a series of lessons in nature-study free to the teachers. This was an experiment on the part of the Academy and the arrangements, as first made, included a series of nine lessons to be given by Dr. H. S. Pepoon. Each of these lessons was on a particular subject, or for the teachers of a particular grade. The first lesson was offered on September 13th. Some time before the hour for the lecture, the seating capacity of our hall was exhausted, and teachers were still coming and begging for admission. They crowded the aisles and outer hall until the Park Police insisted that the regulations of the Fire Department prohibited more people from entering that part of the building. It was an unnecessary announcement, for the actual capacity was exhausted. Many of those who could not enter the room came to the office and requested that another opportunity be given to them to have the benefit of such help in their work. At the next three lessons similar conditions prevailed. It is, indeed, much to the regret of the Academy that there is not a suitable auditorium available where these teachers, anxious to do additional work to better prepare themselves for their work with the children of the North Side, could be accommodated.

We continued this course of lectures until about the middle of November. The total attendance was something over fifteen hundred teachers.

Requests for this course of lessons were received from all parts of the city and arrangements were made by the University of Chicago to partly supply this demand in a more centrally located hall. The University engaged Dr. Pepoon to repeat the Academy Nature-Study course at Fullerton Hall. There the total attendance was over two thousand. Another series was arranged for at the Libby School, on the south-west side, for the benefit of the teachers who were within easy reach of that building. The attendance there was estimated at five hundred and forty. These lessons, which were first given at the Academy, and whenever repeated announced as the Chicago Academy of Science Nature-Study Lessons, had a total attendance during the past fall of three thousand six hundred and fifty (3,650) teachers in the public schools.

It is, indeed, somewhat surprising to see how easily the Academy may become an effective instrument in the educational work of the city. There seem to be so many gaps, so many places where we may fit in, that the regret is we have not better facilities at the building and a larger force who may put their personal efforts into the promotion of science work among the young people and teachers of the city.

CONFERENCES FOR TEACHERS.

Dr. Pepoon offered to be at the Academy on certain afternoons for informal conferences with the teachers and to assist them in that way in their preparation for their nature-study work. This service Dr. Pepoon offered gratuitously to the Academy and to the teachers. The average attendance at each of these informal conferences, of which five were offered, was twenty people. Arrangements should be made by the Academy so that there is always some one available to confer with the teachers with whom we are co-operating. The present members of the staff have numerous requests for such assistance, and they are always pleased to give it. If the educational work is allowed to increase, other arrangements for supplying this demand may soon be called for.

LABORATORY COURSES.

While Dr. Pepoon's work was in progress, special requests were received from the teachers of the North Side for actual laboratory instruction in the elements of Physics and Chemistry which was essential to their proper conduct of the required nature-study courses in the schools. With our present facilities it is impossible to give satisfactory laboratory instruction, but provision was made for certain simpler types of experiments. Dr. John W. Shepherd, head of the Natural Science Department of the Chicago Normal College, and Dr. Donald Grant Smith, one of the assistants connected with the same institution, kindly offered to come to the Academy on successive Wednesday afternoons and to offer, free of any expense to the Academy or to the teachers, series of lessons to assist the teachers in these special lines. Laboratory tables were provided for their classes and, through the kind and prompt co-operation of the Lincoln

Park Board, suitable provision was made for the use of gas in the work-room of the basement. Mr. Shepherd gave eight lessons with an average attendance of thirty-six teachers. The class that came to Mr. Smith's work on the same days numbered, on the average, twelve teachers. The Academy was pleased to co-operate in this work, but the personal services of Mr. Shepherd and Mr. Smith, who, in addition to their preparation and the conduct of the lessons, traveled more than twenty miles to give each lesson, should be recognized as much more than the contribution of the Academy to this work.

COLLEGE CREDIT COURSES.

During the spring months, Dr. John M. Coulter, head Professor of Botany at the University of Chicago, offered a series of twelve lessons on "Organic Evolution," for which eighteen teachers registered, paid their tuition to the University, and completed the course for university credit. Beginning in October, the Secretary of the Academy opened a series of courses on the "History of the Earth." These courses were arranged for under the general regulations of the University of Chicago courses. Thirty-three teachers registered for the first course, paid their tuition to the University, and conducted the regular university work which, at the end, gives them credit toward a degree. The credits received in this way by the teachers are also recognized by the Board of Education and apply toward the required promotion credits necessary by the regulations of the Board for advancement in the city school system. This work will continue through the winter, possibly through the spring months.

PUBLIC LECTURES AND SPECIAL MEETINGS AT THE ACADEMY.

The custom of giving evening illustrated lectures free to the public has been continued throughout the year. Nine lectures were given during the winter and the spring months, and three during the fall months. The program of these lectures is given below. The attendance continues to be large and usually exceeds the full capacity of the hall.

PUBLIC LECTURES.

- February 11—"The Iron and Steel Industry." Mrs. Jane Perry Cook, of the Chicago Normal School.
- February 18—"Glaciers of Alaska." Professor U. S. Grant, Northwestern University.
- February 25—"Water Supply and Water Purification." Dr. C. E. A. Winslow, Massachusetts Institute of Technology.
- March 4—"Bad Air Diseases in Chicago." Dr. W. A. Evans, Commissioner of Health, City of Chicago.
- March 11—"Starved Rock, Deer Park, and the Canyons of Illinois." Horace Hull, of Ottawa, Illinois.
- March 18—"The Inhabitants of Water." Dr. V. E. Shelford, of the University of Chicago.
- March 25—"Fossil Hunting in the West." Mr. Elmer S. Riggs, of the Field Museum of Natural History.
- April 1—"A Wyoming Trail." Mr. Charles A. Heath, Trustee of the Chicago Academy of Sciences.
- April 8—"Chicago Birds and Where to Find Them." Mr. Frank M. Woodruff, of the Chicago Academy of Sciences.
- February 22—Microscopical Soiree.
- January 28—"Anatomy and Physiology." Dr. Anna Blount.
- February 4—"Menstruation and Evil Habits." Dr. Kate I. Graves.
- February 11—"Development of the Ovum." Dr. Caroline Hedger.
- February 18—"Prevention of Venereal Diseases." Dr. Rachael Yarros.
- February 25—"Heredity." Dr. Harriet Alexander.
- March 4—"Ethics of Marriage." Dr. Effie Davis.

This course was given under the auspices of the Social Hygiene Committee of the Chicago Woman's Club.

The attendance at these lectures is estimated at thirty-five hundred people. These evening lectures succeeded as well as could be expected with the present conditions at the Academy building. The seating arrangements are not very comfortable and it is difficult for many of the audience, when the hall is crowded, to see the screen to good advantage. A suitable auditorium seating five hundred people would undoubtedly be crowded for the lectures which we offer, if such room were available. During the fall months, by action of the Executive Board, special guest tickets have been furnished to the members of the Academy, and a section in the lecture hall is reserved for members and their guests until five minutes after eight.

The Chicago Women's Club arranged for two series of six lectures each, on Social Hygiene. These lectures were given during the spring months. They were open to women only, and

were attended in such large numbers that the seating capacity of the hall was usually exhausted. The number attending these lectures is estimated at between fifteen hundred and two thousand.

A special meeting was arranged with the Microscopical Society and an exhibition given in the gallery and main floor of the Museum. Admission to this meeting and exhibition was by invitation, and the number present was at least six hundred.

The lecture hall has been used by various scientific societies. The Lake View Botanical Club has held its meetings here. The Nature-Study Club of Chicago was organized here, and the North Side Section has used the Academy lecture room, and there have been meetings of the teachers called by the District Superintendent or Principals here at the Academy.

STATISTICAL STATEMENT OF THE RELATIONSHIP OF THE ACADEMY TO THE PUBLIC DURING THE YEAR 1910.

Annual attendance at the Museum estimated at.....	500,000
Annual attendance at public lectures.....	3,290
Attendance at Teachers' College Credit Course, given by Dr. Coulter, (18 teachers, 12 lessons).....	216
Attendance at Teachers' College Credit Course given by Dr. Atwood, (33 teachers, 6 lessons).....	198
Attendance at Teachers' Nature-Study Course given by Dr. Pepoon, (9 lessons).....	5,476
Attendance at Teachers' Nature-Study Course given by Dr. Shepherd, (8 lessons).....	290
Attendance at Teachers' Nature-Study Course given by Dr. Smith, (6 lessons)	69
Attendance at Teachers' Nature-Study Course given by Dr. Pepoon in city (a repetition of Academy lectures by request of University of Chicago)	4,640
Attendance at Young People's Nature-Study Course given by Dr. Pepoon, (18 lessons)	1,853
School children addressed by delegates to Young People's Course..	92,750
Children addressed at schools by members of Academy staff.....	3,085
Loan Collections from Museum (286 rooms averaging 50 pupils) .	14,300
Total	624,167

Co-operation with those engaged in the Public School work has been most cordial and the following letters express the appreciation with which our work has been received.

CHICAGO, January 9, 1911.

MR. WALLACE W. ATWOOD,
Secretary of the Chicago Academy of Sciences,
Foot of Center Street, Chicago.

MY DEAR MR. ATWOOD:

The co-operation of The Chicago Academy of Sciences with the public schools of the city has been of great value to the schools, and I should be glad to see the scope of your activities enlarged.

Very truly yours,

(Signed) ELLA FLAGG YOUNG,
Superintendent of Schools

CHICAGO, January 9, 1911.

MR. WALLACE W. ATWOOD,
Secretary of the Chicago Academy of Sciences,
Foot of Center Street, Chicago.

MY DEAR MR. ATWOOD:

Permit me to express to you, and through you to the Chicago Academy of Sciences, my high appreciation of the work that has been done during the present school year by the Academy to assist the teachers and pupils of the public schools in their study of science. I hear it spoken of very highly by both teachers and pupils. I have said frequently that this work is, in my judgment, the most intelligent and most effective work ever undertaken by an outside institution to assist in the work done in the public schools.

I trust that the Academy will see its way clear to continue the work and to extend it along lines such as you have indicated to me in outline.

Very truly yours,

(Signed) C. D. LOWRY,
District Superintendent

CHICAGO, January 9, 1911.

MR. WALLACE W. ATWOOD,
Secretary of the Chicago Academy of Sciences,
Foot of Center Street, Chicago.

MY DEAR MR. ATWOOD:

I wish to express to you my hearty appreciation of the work which has been done by the Academy of Sciences in the way of interesting and assisting the teachers of the public schools in nature study. I have found the teachers greatly interested in the work offered by the Academy of Sciences and have seen in their school work the beneficial results of what they have gotten there. I heartily approve of what has been done, and sincerely hope that you may continue the work you have been doing.

Very truly yours,

(Signed) W. C. DODGE,
District Superintendent

BURLEY SCHOOL, CHICAGO, Jan. 10, 1911.

MY DEAR MR. ATWOOD:

I understand that there is an election at the Academy of Sciences tonight, and it occurs to me that this may be a good time to write you a word of thanks for the interesting and useful classes you have provided for our children this fall at the Academy.

The representatives we have sent are all enthusiastic about their work, and bring back so much that is interesting to tell to the other pupils that we are hopeful you will continue the classes regularly. Each week the representative from the room takes part of the nature study time to tell the other pupils what he has learned at the Academy the day before, and I have repeatedly been summoned by proud teachers to hear the clear and lively reports they bring. We feel under great obligations to Mr. Pepoon for his work with the children, and I hope that feature, at least, of the work the Academy is doing for the schools, will not be curtailed this coming year.

Sincerely yours,

(Signed) MARY F. WILLARD

January 10, 1911.

MR. WALLACE W. ATWOOD,

Secretary of the Chicago Academy of Sciences,
Foot of Center Street, Chicago.

MY DEAR SIR:

The plan of co-operation with the public schools of Chicago now being conducted by the Academy of Sciences is a movement of vital importance to the people of Chicago and especially to the residents of the North Side.

The subject of science teaching in elementary schools has hitherto been fraught with difficulties which the class room teacher could not surmount because of a total lack of suitable objective material for presentation.

But of recent years through the munificence of friends of the children, the humblest teacher has been enabled to command at short notice an abundance of material beautifully mounted, accurately labeled and wisely adapted to the needs of her pupils.

This opportunity has greatly stimulated the work in science, and has been of much benefit to the teacher and the pupil.

One of the most significant features of the movement is a generation of a feeling of confidence in the teacher and the establishment of a sentiment of friendship for the institution and its officers. It is no longer a forbidding palace of gray stone at the gates of our greatest park, but a friendly haven to which the most obscure seeker after scientific truth may come and feel sure of a cordial reception and general assistance.

Of the scientific lectures for the older children of the elementary schools, I can only say that their influence has always been beneficial and that the pupils like laden bees have returned to their hives with rich

stores for themselves and their associates, renewed and delighted by their little journeys into the only rational Fairy Land, the realm of Natural Science.

The result has been wholesome and sane, tending to counteract those baneful influences of city life with which the parent and teacher are forever at war.

In conclusion I desire to express the hope that in the near future we may see a well equipped Children's Museum and Laboratory of Science standing at the entrance of the greatest public park in the world, generously inviting the child, the parent and the teacher to a closer knowledge of Nature and her ways.

Yours sincerely,

(Signed) A. L. STEVENSON,
Principal, Lincoln School

The following extracts from a five page composition written by a delegate show something of what the young people derived from the Nature-Study Course:

One day our teacher announced that the presence of two delegates was desired from the Kosciusko school to attend the fall course in nature-study at the Academy of Sciences. Then I found that I was to represent the Eight Grade of our school.

Never having been in the presence of so many strange children before, I was quite a bit embarrassed, but I tried not to show it. I took a seat, procured a pencil and paper, and was ready to jot down notes which would help me while giving my report to the children.

We learned that the four parts of a flower are the sepal, petal, stamen and the pistil. Composite flowers are made up of many minute flowers bunched together. Flowers having many schemes to attract insects are very high. The lesson on mushrooms was an important lesson as many lives are lost needlessly on account of not being able to tell the difference between the edible and the poisonous mushrooms.. Some people think that the robin and other summer birds leave Chicago in winter because it is too cold. The reason why the majority of the birds leave Chicago in winter is because they cannot find enough food. Here is a way to prove it. If a little chickadee, whose body is no bigger than your thumb, can stay here in winter why can not the big fat robin stay? Because the chickadee can eat things that the robin would not look at.

Having never studied these things, my eyes were opened to a world of wonders. I am sure that the other children in my room feel the same way that I do. We all hope to be farther advanced in this wonderful subject before long. Having heard a little, we are craving for more. I am sure that my efforts to tell the children what I learned were well appreciated because every one was quiet while I spoke.

ROY SINGER

THE OUTLOOK.

It is evident to those immediately connected with the activities of the Academy that the rearrangement of the Museum exhibits is adding greatly to the interest of those who visit the institution, and that is undoubtedly directly interpreted as an increase in the educational value of the Museum. Such rearrangement and replacement of material should continue. The loan of museum material should be continued as far as practicable. The success of the educational work already inaugurated with the children, with the teachers and with the general public, should be increased. The special instructional courses at the Academy where continuous and systematic work is offered to young people and to adults has justified itself and should be extended. The special lectures at the schools, the visiting of class-room work by members of our staff, and the co-operation in all ways practicable with the other educational institutions of the North Side, should be encouraged and continued as far as that is possible.

There are fascinating possibilities in the establishment of a summer nature-study camp where members and their families may spend a portion of the summer season. At least one of the members of the Academy staff should be present at such a camp to assist in the study and collecting of the natural history material available near the camp. The camp should be conducted just so as to pay running expenses, and on that basis it would be a very economical way for members of the Academy to secure a summer outing with educational advantages associated with it.

In connection with our nature-study work it would be highly desirable if a seven or eight acre tract of land, preferably a portion of Lincoln Park, could be set aside in co-operation with the Park Board, as a Wild Flower Garden. There a woodland like those woodlands which are fast disappearing in the environs of Chicago, would be developed. The wild flowers of the region should be allowed to live there, the shrubs, bushes and trees, all growing as in an uncultivated tract. There the birds might be given special homes, the insects collected and their activities studied, and where injurious to plant life, means of extermination studied. It would be an out-door laboratory for much of the scientific work now being undertaken by the institution. Such Wild Gardens have been established in some other cities in

the public parks, and, as the difficulty increases each year for those who enjoy the native woodlands, it would appear reasonable for the partial replacement of conventional gardens and park areas by a reproduction of a native woodland.

Most of the above lines of work have been established and it is for us to consider now what are the essential features for the perfection of our organization and an appropriate increase in our facilities to take the place in the North Side of the city which is apparently open to us. Throughout the above report it is evident that we have really reached the limit of our growth with the present physical facilities and resources at our command. Throughout the report it has been emphasized and it is clear to one intimately connected with the work that the opportunities for the Academy are far beyond those which we have accepted. It is very encouraging to note the enthusiasm with which the people of the North Side have taken up each of the new propositions which the Academy has offered. It is equally surprising that whatever the announcement is, whatever the course of instruction may be, whatever the lecture offered is, the attendance usually exceeds the seating capacity of our lecture hall. Whether this work is for children or for teachers, for the women in the general public, for the adults in mixed audiences, whether it is free or whether there is a tuition to be charged, the work is always supported. Not a single course that was offered has been withdrawn for lack of interest. It appears that the North Side people are ready and anxious for advanced educational opportunities. There is no institution in this section of the city so happily situated for entering this field of activity. There is no institution in this part of the city established and endowed for such purposes except the Chicago Academy of Sciences. It seems from the experience, the conduct of the work and from an examination of the educational opportunities on the North Side of Chicago that the Chicago Academy of Sciences ought to expand, or ought to have double or triple the space capacity. It needs a good auditorium equipped with the best of facilities for lectures; possibly equipped with a motion-picture machine by means of which the wonderfully educational views of true scientific merit may be used in the course of our lectures.

We need a children's museum. We are ideally located for

just such an institution. As we are now organized, we are fortunate in having a man at the head of the Museum peculiarly fitted for superintending the development of such an institution and there is no field in educational work which yields greater returns than the work with young people.

It is highly desirable that we enlist the interest of more individuals on the North Side. The membership need not be limited to people specially interested in science. The institution is an educational institution and any one interested in the general welfare of the people of this city, and especially in the cultural development of the North Side, should become members of the Academy, and during the next year a campaign with suitable descriptive matter for circulation should be conducted to enlarge the membership in the Academy. In this campaign every one now connected with the institution will have an opportunity to play an important part.

The present statistics relative to the membership in the Academy are given in the following table:

Active members who have paid up to date.....	98
Corresponding members	7
Life members	15
Fellows	19
Members whose dues have been remitted.....	11

Total150

WALLACE W. ATWOOD, Secretary.

REPORT OF THE CURATOR OF THE MUSEUM.

To the Board of Trustees and Members of the Chicago Academy of Sciences:

Gentlemen: I have the honor to present herewith my seventeenth report on the work of the Museum, for the year 1910.

The energies of the Curator and his assistants of the staff have been directed mainly toward the completion of the Museum plans approved by the Executive Board and the Board of Trustees two years ago, which has resulted in a decided betterment of the exhibits in several particulars, although there is still much to be accomplished before the Museum is completely rehabilitated. At present, on account of the lack of room, the birds are over-emphasized, occupying twelve out of twenty-one cases

on the main floor, obviously too large a proportion of exhibition space for one order of the vertebrates. This is due, in part, to the popularity of bird study and also to the particular educational methods adopted for the installation of the bird exhibits.

The change from the older to the newer methods is necessarily a slow process. It is a simple matter to exhibit a collection of natural history specimens in their proper orderly sequence, even if the collection be of considerable size; but to prepare and install each exhibit so that it has a story to tell the visitor or student, is quite another matter, requiring both time and an infinite amount of patience.

The change in the Museum policy of the Academy has been favorably commented upon by the curators and directors of several museums, as well as by many visitors who have expressed themselves as strongly in favor of educational methods in museum exhibits.

The work of the year may be summarized by departments as follows:

DEPARTMENT OF ORNITHOLOGY.

A complete rearrangement has been made of the bird collections, rendered necessary by the further development of the educational exhibit, the initiation of which was recorded in my report for 1909. It is proposed to exhibit the birds which are known to nest within the limits of the State of Illinois, together with their eggs and young. It is also planned to exhibit each species in its summer and winter plumage. A recent tabulation of the nesting birds of Illinois gave a total of 179. As four groups are needed to complete the life history of each species—nest and eggs, young, summer and winter—it will require 716 groups to complete the exhibit as planned, truly a gigantic undertaking but one which we believe possible of accomplishment. For obvious reasons it is not wise in a museum visited so largely by school children, to exhibit a collection of birds' eggs, nor does it seem good policy to do so even in any public museum, whether large or small. The eggs belong with the nest, and should not be exhibited without the nest and the natural setting, so far as that is possible.

The bird collection is planned in the following series:

1. Birds of the Chicago Area. This exhibit will occupy four double cases ten feet long, which will contain all species of birds which have been authentically reported within a radius of fifty miles from the center of the city. The collection will be arranged taxonomically to show the systematic relation of the birds.

2. The Nesting Birds of Illinois. This collection will be arranged from an ecological standpoint, the emphasis being placed on the habitat selected by the bird, as well as the particular method used in constructing the nest. The grouping of this exhibit is shown below.

Open nests in trees, bushes and vines.

Nests saddled on branches.

Pensile or hanging nests.

Nests in holes in trees.

Open nests in fields.

Open nests in woods.

Nests in roots of trees.

Open nests in swamps and marshes.

Open nests in reeds.

Nests about buildings.

Nests in holes in banks.

Parasitic nesters.

3. Structural Characteristics of Birds. This exhibit will include such features as correlation of wings, tails, bills, feet, tarsi, etc.; sex and seasonable differences, plumage changes and cycles, feather characteristics; and nesting peculiarities, such as form of nest, altricial and precocial young, forms of eggs, etc.

4. Geographic exhibits, showing the characteristic birds of various countries.

A good start has been made in carrying out the plans as outlined above. During 1910 two cases were finished of the birds of the Chicago area, including the perching birds, the woodpeckers, the hawks and owls, the gallinaceous birds and the shore birds. This collection comprises 317 specimens, exhibited, for the most part, in pairs. The generally accepted common English name has been printed for each specimen, and no other label is permitted on the inside of the case; but on the outside, printed labels have been placed which give a description of the family,

together with a list of the Chicago species, with their season and time of arrival and departure.

Eight cases have been set aside for the exhibition of the nesting birds of Illinois, five of which were arranged during 1910. Nine species have been added to this collection, making a total of eighteen species now on exhibition. The species added are as follows: Bronzed Grackle, Trail's Flycatcher, Parula Warbler, Sapsucker, Hummingbird, Song Sparrow, Bobolink, Catbird, Yellow-billed Cuckoo. All but the Parula Warbler, the Sapsucker and the Hummingbird comprise both eggs, nest and young. Summer groups of the Mourning Dove and Screech Owl were also added last year. Altogether nineteen groups were prepared during 1910. Material for twenty additional species were obtained last spring and the groups will be finished during 1911. Thirty-nine groups have now been installed and with the material now in hand, it is confidently expected that by January 1, 1912, forty-two species represented by ninety groups will be on exhibition.

All cases have been installed with the new fastening devised by Mr. Woodruff and the Curator. This fastener has proved eminently satisfactory not only for the installation of single birds, groups, etc., but also for attaching framed labels to the outside of the case. We have received many favorable comments concerning the practicability and simplicity of this museum accessory. Its one great advantage is the inconspicuousness of the screw attachment which permits a rearrangement of a case without leaving unsightly scars, which invariably cause a case to be repaired and repainted before being reinstalled. We know of no other attachment which will accomplish the same purpose. The fastener is now in use in several institutions, and a sample will be cheerfully furnished to the head of any reputable institution.

The addition of accessory material for these groups has progressed quite satisfactorily, eighteen common trees, shrubs and flowers being now represented. It is planned to have the accessory bird groups exhibit as far as possible the more familiar trees, shrubs, flowers and other vegetation of the State of Illinois. Thanks are especially due Mr. H. Clowes, of the Milwaukee

Public Museum, for his very careful and conscientious work in the production of the artificial plants and flowers.

Considerable work has been done on the structural collection. Panels illustrating structure and form of bills, feet, tarsi, feathers and tails have been completed. One on wings is in preparation.

One new case for the local collection was constructed, one case repainted and placed on rollers, and two cases for the collection of nesting birds were reconstructed during the year.

MAMMALS AND OTHER VERTEBRATES.

To make room for the ecological bird collection, two cases, previously occupied by mammals, were emptied and the mammals were squeezed into other cases. This necessitated a complete rearrangement of the mammal collection to provide for the addition of excluded specimens. No work worthy of note has been done on the vertebrate collection. It is hoped that time and means may eventually be provided for the arrangement of this material along the same lines as those upon which the birds are now being installed.

DEPARTMENT OF MOLLUSCA.

The plans for the development of this department were outlined in my report for 1909.¹ Following the plans outlined in this report, the collection of Illinois Mollusks has been rearranged and relabeled and arranged in two series: (1), an exhibit of every species known to inhabit the state, arranged in sets showing age variation; and (2), a study series designed to ascertain the variation, geographic distribution and frequency for this class of animals throughout the state. One case containing the Pelecypoda (bivalves) and a portion of a case containing the water-breathing snails, have been completed. It is proposed to finish the fresh-water and land snails during 1911, as well as the synoptic collection and the exhibit of mollusks useful to man. Labels printed in large, clear type have been provided for each species in the exhibit series, and one large printed label describing the characteristics of the fresh-water mussels has also been provided.

¹See Bull. Chl. Acad. Sci., III, No. 3.

One interesting ecological exhibit has been prepared and is on exhibition over the case of fresh-water mussels. This is enclosed in a small glass case and explains by means of a mounted fish (small-mouthed black bass) and several clams (*Lampsilis luteola*) the development or life cycle of fresh-water clams. Embryo clams (*glochidia*) are shown clinging to the gills and fins of the fish and attached by a byssus to the pebbles at the bottom of the river; several very young clams are beginning life among the pebbles. The exhibit is entitled "How fresh-water clams grow."

Three thousand four hundred ninety-two specimens of Mollusca have been identified, labeled and installed with the study series. As reported last year, a large amount of material awaits time and opportunity to properly classify; 3,097 specimens have been labeled and identified for the collection of Illinois Mollusks.

TAXIDERMIC DEPARTMENT.

The Taxidermic Department, under the able direction of Mr. Frank M. Woodruff, has completed one of the most successful years of its history. Early in the year the services of Mr. Emil Youngren were secured as Museum Aid and this added assistance has greatly increased the amount of work accomplished by this department. To provide for the ecological installation of the nesting birds of Illinois, all of the old groups, some twenty in number, required a more or less complete rearrangement. Nineteen new additional groups have been prepared. In order that the Chicago collection of birds might be of more use to the school children, the exhibit was spread out, the birds exhibited in the upper part of the case being lowered to about six feet above the floor. Only the larger birds, which are easily seen, are installed at this height, the smaller birds being from two to four feet above the floor. This rearrangement has entailed the changing of the entire case of land birds. One new case of Chicago birds has been added, containing the water birds (*Limnicolæ Paludicolæ*), the specimens being either newly mounted or assembled from the general collection.

The year's work of this department may be tabulated as follows: .

Birds mounted	75
Bird-skins made	152
Bird groups finished.....	19
Bird groups reassembled.....	20
Other vertebrate skins made.....	3
Branches of accessory material.....	20
Hollow stumps prepared.....	7
Specimens reinstalled and partly renovated for Chicago cases	317
Bird stands made for Chicago cases.....	45
Loan collection boxes prepared.....	49
Mollusks cleaned and sorted.....	1,000

FIELD WORK.

A considerable amount of time has been spent in field work. Mr. Woodruff has made twenty-six trips and Mr. Youngren ten trips to points in the vicinity of Chicago. Several rare records have been secured, notably the Yellow-bellied Sapsucker and the Barn Owl, at Kouts, Indiana. Several other rare or unusual nests with young were secured, including the Whip-poor-will, the Chickadee, the Woodcock, the Hummingbird and the Prothonotary Warbler. The Curator spent several weeks making an ecological survey for Braddock's Bay near Charlotte, New York, and secured over 2,500 specimens of aquatic life.

The most important field work of the year has been the biological survey of glacial Wilmette Bay, an embayment of glacial Lake Chicago. This survey was made possible by the construction of the north shore channel constructed by the Commissioners of the Sanitary District of Chicago. A large number of geological sections have been made along the entire length of the canal, photographs have been liberally taken and a great quantity of material has been secured including plants, fish, birds and mollusks. Investigations supplementing this work have been carried on in other parts of the area, including the new Naval Station near Waukegan, the vicinity of Oak Park, Summit and Stony Island. It is planned to prepare a report on the life of these deposits.

Additions received through the field work of the Museum staff may be tabulated as follows:

Adult birds	200
Young birds	30
Nests	18
Mollusks	3,040
Fossils	9,351
Total	12,639

PRINTING AND CATALOGING.

The work for this department has been totally beyond its ability to perform. The labeling and cataloging are far behind the exhibits and there seems to be no possibility of bettering these conditions until a printer can be secured. Large labels have been printed for the Chicago bird cases, describing the family characteristics, the seasonal relations and the time of arrival and departure of the birds. Two labels in frames 30 x 6 and two 30 x 3 inches have been finished and a fifth is partly completed. Eleven such labels remain to be printed. Descriptive and map labels are also needed for several groups in the nesting birds of Illinois. Labels have been printed for the case of Illinois shells, so far as that has been completed. Fifty-five descriptive labels were printed for the bird house of the Zoölogical Department of Lincoln Park.

The work accomplished by this department may be tabulated as follows:

PRINTED MATTER

	KINDS	IMPRESSIONS
Descriptive labels	122	515
Smaller labels	681	5,579
Hand-printed labels	204	204
Total printed matter	1,007	6,298

CATALOG ENTRIES

Museum registers	3,289
Museum card catalogs	1,841
Total entries	5,130

In addition to the above work, Miss Bunnell has written over one thousand letters and about five hundred pages of manuscript, besides caring for and acknowledging the publications received by exchange for the library.

DEPARTMENT OF PHOTOGRAPHY.

As in past years, this department, under the direction of Mr. Woodruff, has been of invaluable assistance in providing material for illustrative purposes both for the lantern and for publication. A new photographic enlarging machine has been secured for this department and the results obtained have been very satisfactory. Besides preparing negatives, prints and slides for school work, Mr. Woodruff has also provided the photographic plates for the Curator's monograph of the *Lymnæas*.

The following results have been produced:

Negatives	432
Slides	404
Prints	409
Enlargements	50

Total	1,295
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CARE OF THE BUILDING.

A considerable amount of repairing and renovating has been done, for which the Academy is greatly indebted to Superintendent Myron H. West and the Lincoln Park Commissioners. A loose step at the top of the stairs entering the main hall, has been reset, and the windows as well as the roof have been gone over. The Taxidermist's work-room has been completely renovated and neatly calcimined and the men's toilet has been cleaned and thoroughly painted. A new electric lantern has been competently wired by the park electricians, to whom the Academy's thanks are due for the very efficient manner in which the work has been done. Wiring has also been done for the new photographic enlargement machine.

Thanks to the care of the efficient janitor force, the building has constantly been kept clean and in good order. The large number of lectures given for the teachers and pupils of the public schools has entailed a large amount of work and thanks are due Engineer John Kilcourse and his assistants, Mr. Henry Purdy and Fred Neubauer. It is a pleasure to report that this extra work has been undertaken cheerfully and without complaint.

The basement has been rearranged, the south room being partly cased to care for the extensive loan collection series. This

has made it possible to build a new case for the taxidermic room, for the storage of chemicals and other taxidermy supplies. A corner in the south room has been partitioned off for the printing plant where all work of this character is now performed. The north store-room has been rearranged and a considerable amount of rubbish has been discarded, thus making room for the safe storage of much valuable material.

RESEARCH WORK.

Considerable time has been devoted to research work. Aside from the lesser papers mentioned below, the Curator has prepared a paper on the "Molluscan Fauna of Tomahawk Lake, Wisconsin, with Special Reference to Its Ecology," which will be published in the Transactions of the Wisconsin Academy of Arts and Sciences. Two papers, one on "School Loan Collections as Prepared by the Chicago Academy of Sciences," and the other on "A Method for Fastening Large Labels to the Outside of Cases," were read at the Buffalo meeting of the American Association of Museums. The most important research work has been the completion of the Monograph of the Lymnæidæ of North and Middle America, which contains 706 pages of manuscript, 58 full page plates and about 50 maps and text cuts. This monograph, which is now being published as a special bulletin, is an illustrated, descriptive and bibliographic account of this familiar group of fresh-water pond snails, discussing the anatomy, ecology, distribution in time and space, classification, instructions for collecting, a systematic discussion of the species and a complete bibliography. It will make a bulletin of about 550 pages and will be issued in February.

The construction of the new north shore drainage channel between Bowmanville and Wilmette, has disclosed a series of sedimentary deposits in post-glacial Wilmette Bay, which contain organic remains quite fully recording the life of Lake Chicago during several of its later stages.* Large collections have been secured and a report will be prepared as soon as some additional field work has been done in other parts of the area.

*See Science, n. s., XXXI, no. 801, May 6, pp. 715-717, 1910.

The following papers have been published during 1910, based on Museum material:

- "A New Variety of *Lymnaea Stagnalis*," *Nautilus*, XXIII, No. 9, pp. 112-113, Feb., 1910; *Nautilus*, XXIII, No. 10, pp. 125-126, March, 1910.
- "Note on Free Public Museums," *Science*, n. s., XXXI, No. 789, Feb. 11, p. 221.
- "The Ecology of the Skokie Marsh Area with Special Reference to the Mollusca," *Bulletin, Ills. State Lab., N. H.*, VIII, Art. IV, February, 1910, pp. 437-499.
- "Preliminary Note on the Life of Glacial Lake Chicago," *Science*, n. s., XXXI, No. 801, May 6, 1910, pp. 715-717.
- "Suggestions for an Educational Exhibit of Mollusks," *The Museum's Journal*, I, No. 11, pp. 394-397, May, 1910.
- "The Ecology of the Skokie Marsh Area with Special Reference to the Mollusca," (*Abstract*) *Trans. Ill. State Acad. Sci.*, III, pp. 106-108, 1910.
- "Description of a New *Lymnaea*," *Nautilus*, XXIV, No. 5, pp. 58-60, September, 1910.
- "Mollusks of Unionville, Connecticut," *Nautilus*, XXIV, No. 6, pp. 68-69, October, 1910.

RELATIONS TO OTHER MUSEUMS.

The Curator has continued to furnish information on various museum subjects. Many inquiries have been received concerning the new fastener in use for the bird exhibition* and several samples have been made and presented to prospective users.

Over 2,500 specimens, mostly mollusks, have been identified for twenty-five institutions and private individuals, including the University of Chicago, the University of Illinois, Alma College, Michigan, the United States Fish Commission, and several Chicago high schools.

ACCESSIONS TO THE MUSEUM.

The accessions for 1910 are larger than for several years past, totaling 16,012 specimens, representing 160 separate accessions. Much of this material is of great value from a scientific as well as an educational standpoint.

See page 140.

The additions to the Museum may be tabulated as follows:

Minerals	20
Fossils	9,351
• Botanical specimens	54
Insects	43
Mollusca	5,872
Pearls	50
Vertebrates	11
Birds	244
Birds' eggs	66
Birds' nests	26
Industrial material	144
Lantern slides	131
Total	16,012

Acknowledgment is especially due to the Washburn-Crosby Company, Mr. Henry Hutter, Secretary, Memphis Cotton Exchange; Mr. F. D. West, of Chicago; Edward K. Warren and F. W. Chamberlin, for presenting material illustrating the wheat, cotton, featherbone, coffee and rubber industries.

Material has been received from the following persons, to whom our thanks are due:

G. A. Abbott, C. C. Adams, E. E. Armstrong, Wallace W. Atwood, Frank C. Baker, S. S. Berry, L. Berman & Son, James Bowles, Erwin C. Bratts, M. G. Bunnell, W. W. Calkins, F. W. Chamberlin, H. K. Coale, Mr. Coleman, Robert Coombs, W. H. Dall, Arthur C. Davis, L. E. Daniels, Raymond Dreyer, Dr. George Eisenbrand, Wallace Evans, John Faust, L. S. Frierson, S. W. Geiser, Joseph Goder, John Hall, Harry Hall, A. H. Hinkley, Henry Hutter, F. B. Isley, McCormick Jewett, E. C. Johnson, J. G. Johnson, J. Keiser, S. A. Kurtz, F. R. Latchford, Arthur S. Lewis, H. A. MacCurdy, H. T. Mortensen, E. L. Moseley, Miss Motschman, Fred Neubauer, Miss Martha O'Hara, A. S. Pease, Charles F. Phelps, Joseph R. Putnam, Walter Schoben, Dr. E. J. Senn, Emanuel Shepler, Miss Shaw, J. A. Steel, V. Sterki, Joseph Thompson, Bryant Walker, Rhoda Wanless, Washburn-Crosby Company, Edward K. Warren, O. S. Westcott, Emily C. Westberg, H. E. Wheeler, A. B. Wolcott, Frank M. Woodruff, Hugh Wynne, Emil Youngren, James Zetek.

INVENTORY.

On January 1, 1911, the Accession Books showed the following material to be in the possession of the Academy:

Minerals	10,690	
Rocks	565	
Fossils	31,636	
Botany	9,401	
Lower Invertebrates	2,396	
Mollusks	165,643	
Insects and Arachnids	34,123	
Crustaceans	508	
Fishes	149	
Batrachians and Reptiles	557	
Birds	5,211	
Bird nests and eggs	2,761	
Mammals	383	
Loan collections	1,000	265,023
Microscopic slides	1,751	
Photographic negatives	2,145	
Lantern slides	2,178	
Books, pamphlets and maps	31,163	37,237
Total		302,260

PLANS FOR 1911.

It is planned to vigorously push the educational features of the Museum during 1911. Work on the nesting birds of the State will be carried on and it is hoped that 20 or more additional nesting species may be secured in the spring, besides a quantity of material illustrating plumage changes. Three new cases will be needed to complete the exhibition of the nesting birds and three of the alcove cases on the west side of the main floor will be reconstructed to meet this need. It is hoped that funds will be available for the purchase of one additional case for the birds of Chicago, to contain the herons and ducks. It is also planned to install one case with the typical birds of different countries, as South America, Africa, Europe, Philippine Islands, etc.; a case of birds referred to in literature is also planned. So far as it is possible the bird cases now arranged will be furnished with the necessary descriptive labels.

The Insect Collection is in need of a complete rearrangement to meet the needs of modern museum exhibition. Unit cases have been planned and if these can be provided, they will be installed with such exhibits as "How Insects Hide," useful and injurious insects, life histories of Illinois Butterflies, etc. The large mass of insects will be carefully stored in standard boxes and placed where they will be useful to the advanced student. It is imperative that a large number of these storage boxes be provided in order that the safety of the collection may be assured.

The segregation of the Illinois collection of Mollusks has proven a decided success and the two cases appropriated for this purpose will be completely installed and labeled before the close of the year. Two cases of Mollusks will be installed to form a synoptic collection of the principal families and genera, in order that students may become familiar with the classification of this group of animals without being confused by a mass of similar forms. It is planned to devote one case to a display of those Mollusks particularly useful to Man, such as pearl oysters, and pearls, river clams and pearl buttons, mother-of-pearl as ornamentation, oysters, clams, snails, etc., used as food. It is further planned to prepare a number of small groups showing the different places in which clams, snails and other Mollusks live—the ocean shore, the woodland pool, the river shore—as well as several groups showing how the fishermen gather the button clams by means of the crowfoot dredge.

There is a large amount of work to be done before the entire Museum can be said to be in a thoroughly useful condition, but only that mentioned above is possible of accomplishment during the year 1911. The other vertebrates—the mammals, fishes, reptiles and batrachians—need rearrangement and reinstallation along similar lines to those now being used for the birds: the corals and sponges should be rearranged to show how these animals live and their usefulness both as geological agents and as economic material; the fossils, rocks and minerals should also be arranged along modern educational lines. To carry out this work successfully will ultimately necessitate the addition of at least one building and two buildings will in point of fact be none too many.

It is confidently believed by the Curator that, should the Academy be able to carry out the rehabilitation of the Museum along the lines already planned—viz., the exhibition of a complete collection of the fauna, flora and geology of our own State, supplemented by certain illustrative exhibits of other countries—it will have performed a unique service in the educational field of our country.

In conclusion, the Curator wishes to acknowledge his indebtedness to the efficient aid of the members of the Museum staff who have worked so faithfully and efficiently in carrying out the plans outlined in this report. Thanks are also due the following persons who have greatly aided the Curator in many ways:

Dr. Henry C. Cowles, University of Chicago.

Dr. H. S. Pepoon, Lake View High School, Chicago.

Dr. S. A. Forbes, Illinois State Laboratory of Natural History.

Bryant Walker, Detroit, Michigan.

L. S. Frierson, Frierson, Louisiana.

Mr. H. H. Fack, Secretary, Automatic Button Co., Muscatine, Iowa.

Dr. V. Sterki, New Philadelphia, Ohio.

Dr. H. A. Pilsbry, Academy of Natural Sciences, Philadelphia.

Acknowledgment is especially due the authorities of the new Naval Station near Waukegan, for permission to make certain studies inside the grounds of the station.

Respectfully submitted,

FRANK C. BAKER, *Curator*.

REPORT OF THE LIBRARIAN.

As stated in my last report, the year 1910 has been one of steady growth, no work of an extensive nature having been accomplished. Lack of adequate stack room is more keenly felt than when my last report was made, and this want must soon be met. An analytical catalog is needed but cannot be made until an additional assistant is provided. The room formerly used as a check-room has been renovated and supplied with three new stacks for the use of the United States Department of Agriculture and the State Experiment Station publications. The transfer of these volumes has enabled the librarian to rearrange certain foreign publications which were before badly crowded. The title card catalog has been brought up to date, but aside from this work, no catalog work has been done.

The library has been used by a number of students and teachers in the University of Chicago, University of Illinois, high school teachers and by a number of individuals seeking scientific references. Its use is being greatly facilitated by the binding of the pamphlets, 1,690 of which were bound in 241 volumes during the past year.

The additions to the library by gift, purchase and exchange number 2,834, divided as follows:

	VOLUMES	PAMPHLETS
Foreign exchange	17	939
Domestic exchange	58	959
Gift	3	740
Purchase		118
Total	78	2,756=2,834

All accessions have been properly installed in the library.

The following persons have presented books or pamphlets to the library:

Henry Wilde, Rudolph Guimmaraes, M. Snellen, H. Ekama, Charles Janet, Louis Voission, J. F. Lehmann, A. J. Monne, Agnes Chase, Sir Edward Durning-Lawrence, Bart., A. C. McClurg & Co., James A. Wright; Slaton Thompson; A. R. Crook, S. A. Forbes, Norman A. Wood, Luigi Cufino, Joseph and Fordyce Grinnell.

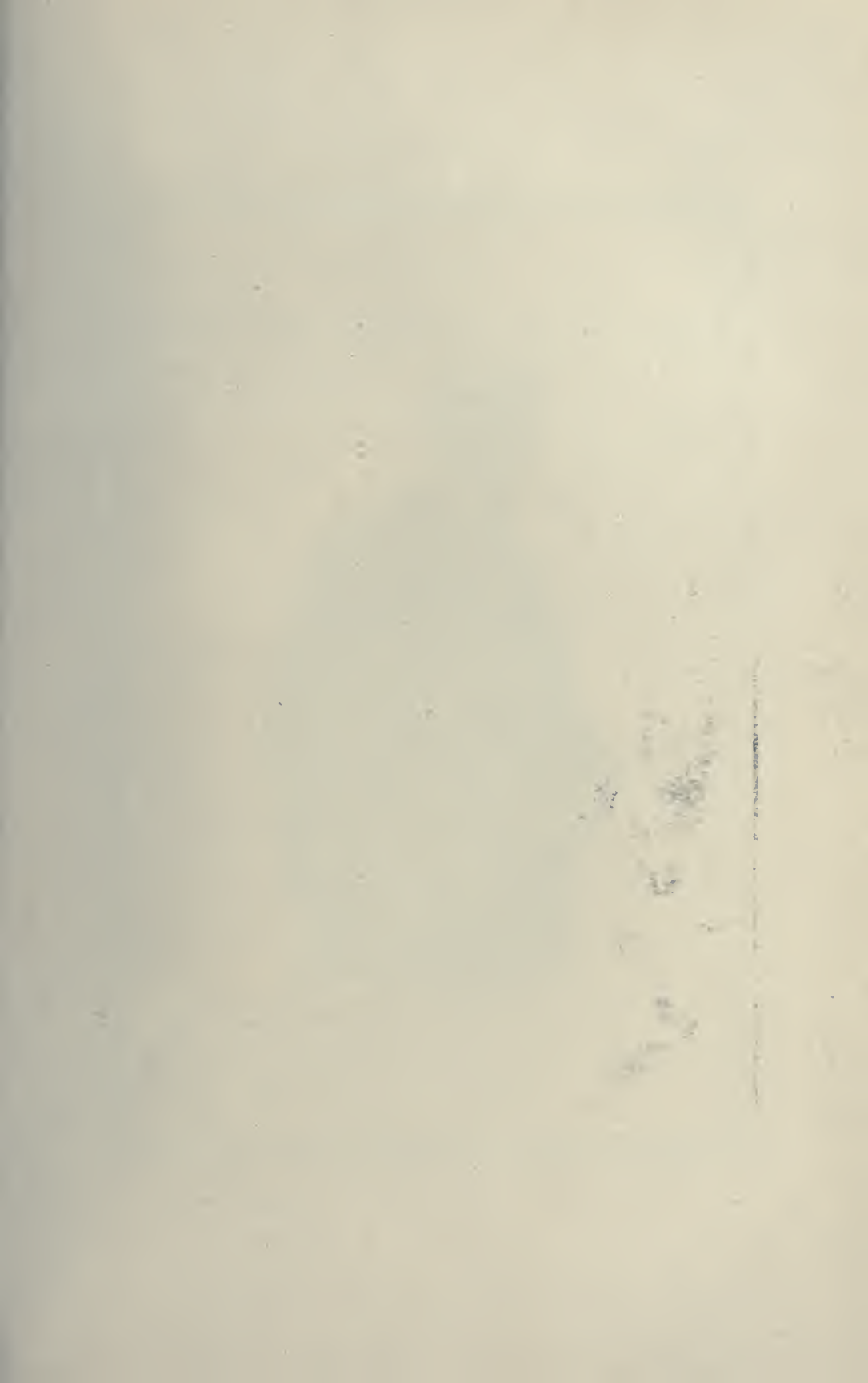
Dr. Joseph L. Hancock has presented over 700 pamphlets to the Academy, many of which fill some long-existing gaps in our library.

We are now exchanging publications with 321 foreign, and 167 domestic societies, a total of 488.

A number of the publications have been sold during the past year, the bulletins on the Mollusca, Fungi and Birds being most frequently requested.

Respectfully submitted,

FRANK C. BAKER, *Librarian*.





JOSEPH R. PUTNAM

IN MEMORIAM

JOSEPH R. PUTNAM

The death of Joseph R. Putnam, September 7, 1910, removed from the active members of the Academy one who has long been identified with the Society and who had served as a member of the Board of Trustees for the preceding eighteen years.

Mr. Putnam was born in 1835, at Houlton, Maine. He spent his boyhood days in New England, and graduated from Williams College in the year 1858. At the opening of the Civil War, Mr. Putnam enlisted in the Third Minnesota Infantry. In 1862 he was made Lieutenant of that Infantry, and in 1864 Lieutenant-Colonel of the 43rd Colored U. S. Infantry. Soon after that he was taken prisoner. While on parole on account of illness, he served in General Sibley's staff in the Sioux Indian Campaign. Later, upon his return to his own company, Mr. Putnam served on the Signal Corps until the close of the war. He served in the battles of Chickamauga, Missionary Ridge and Lookout Mountain.

Following the close of the Civil War, Mr. Putnam came to Chicago and soon established himself in the real estate business. As a citizen of Chicago he took an active interest in the general welfare of the community. He became a member of the Chicago Academy of Sciences before the great fire in 1871, when the records of the Academy were destroyed. He was among the most enthusiastic members in the re-establishment and growth of the Academy after the fire, and up to the time of his death gave a great deal of attention to the welfare and development of the institution.

In the year 1892 he was elected to membership on the Board of Trustees, and in 1899 chosen as the president of that Board, in which capacity he served until the time of his death. During Mr. Putnam's association with the Academy he endeared himself in many ways to the members of the Society.

ANNOUNCEMENTS.

COURSES IN NATURE STUDY WORK.

The following courses in Nature Study will be given at the Academy during the winter and spring season of 1911:

Course V. *Trees*. A laboratory course of six lessons to eighth grade pupils. A special course limited to those who have served as delegates in previous courses at the Academy. Saturday mornings, 11 to 12.

Lesson I. Sat. March 4—How to know the trees in Winter.

Lesson II. Sat. March 11—Tree lesson continued.

Lesson III. Sat. March 18—Tree lesson concluded.

Synopsis of the three lessons.

- a. Study of the external twig markings and their origin and use.
- b. Internal structure—gross and microscopic.
- c. Special and peculiar twig markings examined and interpreted.
- d. The classification of trees by common twig features.
- e. The forest trees of the Chicago Area. Their twig characters.
- f. The street trees of Chicago. Their twig characters.
- g. Tree accidents and diseases.
- h. Reading past weather and other history by the tree growth.
- i. The growth and age of trees.

Lesson IV. Sat. March 25—The characteristics of woods and lumbers.

Becoming familiar with

Varieties and their sources.

Grain and peculiar markings.

Weight, hardness, and strength.

Durability.

Uses of each special kind.

Lesson V. Sat. April 1—The products of stems by actual examples.

Foods, resins, gums, sugars, starches, fibers,
dyes, drugs, cloths, fuels, oils, etc.

Lesson VI. Sat. April 8. Noted trees of the world. A lantern lecture.

Course VI. *Wild Flowers of Chicago Area*. This course will be given to delegates from the seventh and eighth grades. Admission will be by delegates' cards. Wednesdays from 4 to 5 p. m., beginning May 3.

By DR. H. S. PEPOON.

Lesson I. Wed. May 3—The catkin, ament or "Pussy" types.

Examples studied are willows, poplars,
oaks, birches, hazels.

Explanation of type and study of individual flowers.

Valuable plants of the group.

Lesson II. Wed. May 10—The flowers without petals. Apetalous types.
Examples. Marsh marigold, wind flowers,
rue anemones, hepaticas.
Cultivated plants of this type.

Lesson III. Wed. May 17—The Monocotyledonous types.
Examples. Trilliums, tulips, dog-toothed
violets, bellworts, hyacinths, smilax.
Use of type as ornamental plants.
The meaning of the universal bulb-pro-
duction found here.
Valuable products.

Lesson IV. Wed. May 24—The violets and irregular flowers.
Few early examples.
Meaning of irregular flowers.
Violets and pansies in cultivation.
Cultivated orchids, lady-slippers, dutch-
man's breeches.

Lesson V. Wed. May 31—Flowers with united petals. Composite
flowers.
Examples. Phlox, dandelion, Jacob's lad-
der, mertensia.
Blasts of garden flowers.
Rank among flowers. What makes a plant
"high" or "low."
Useful products of this group.

Lesson VI. Wed. June 7—A lantern lecture—Chicago Wild Flowers.

Course VIII. *Illustrated Lessons in Physical Geography.* The
course will be limited to delegates from the
fifth and sixth grades. Admission may be had
by delegates' cards. Saturday at 9:30 to 10:15
a. m.

By MISS MARY A. HARDMAN.

Lesson I. Sat. March 4—How the Soil is Made. (Pupils are re-
quested to bring samples of soil.)
A discussion of the action of water,
changes in temperature, wind, ice, and
vegetation on rock.

Lesson II. Sat. March 11—The Work of Rivers.
A. How they make their Valleys.
(a) Cutting.
(b) Carrying.
(c) Depositing.

B. Growth of the Valleys.

- (a) Youth.
- (b) Maturity.
- (c) Old Age.

C. Special Features

- 1. Waterfalls
- 2. Natural bridges.
- 3. Canyons
- 4. Terraces.
- 5. Piracy.

Lesson III. Sat. March 18—Mountains (A study of pictures of Mountains).

- a. How Mountains are made.
- b. Changes now going on among the Mountains.
- c. Life among the Mountains.
- d. Special scenic Features.

Lesson IV. Sat. March 25—A Trip over a Mountain Glacier.

- a. The high mountains where glaciers exist.
- b. The great snowfields.
- c. The changing of snow into ice.
- d. Movement of the glacier.
- e. The material carried.
- f. Work being done.
- g. The lower end of a glacier.
- h. The melting away and final disappearance of a glacier.
- i. Effects of glaciation.
- j. Was there ever a glacier in this region?

Lesson V. Sat. April 1—A study of Shore Lines.

- a. Development of
 - 1. Sea cliffs.
 - 2. Sea caves.
 - 3. Chimney rocks.
 - 4. Arch rocks.
 - 5. Terraces.
- b. Building Bars and Beaches.
- c. Some good harbors.

Lesson VI. Sat. April 8—The Common Rocks. (A laboratory study.)

- a. The formation of
 - 1. Sandstone.
 - 2. Shales.
 - 3. Conglomerates.
 - 4. Limestone.
 - 5. Slates.
 - 6. Marbles.
 - 7. Granites.

Course VII. *A Field Course for Teachers.* Six all-day field trips to near-by places. The course will be limited to thirty. Application for membership should be made as early as possible at the office of the Secretary. Car and time directions will be announced at each trip for the next trip.

By DR. H. S. PEPOON.

Field Trip I. Sat. April 15—To the North Shore.
For willows, hepaticas, mosses, lichens
and other things.
Meet at the Academy at 8:30 A. M.

Field Trip II. Sat. May 6—The DesPlaines Valley at Turner Park.
For phlox, dicentra, trillium, innocence
and a host more.

Field Trip III. Sat. May 13—Clark Station, Indiana.
Early sand ridge flora.

Field Trip IV. Sat. May 20—The original prairies, Dunning, Berwin or
other places, decision reserved.

Field Trip V. Sat. May 27—North Branch Chicago River at Glen View.

Field Trip VI. Sat. June 3—Millers or Dune Park trip.

TEACHERS' COLLEGE CREDIT COURSE.

The Identification of Common Minerals and Rocks.

By Wallace W. Atwood.

Tuition, \$6.50. 12 Lessons.

Credit of one minor at the University of Chicago.

Thursdays at 4 p. m. Beginning April 6

No prerequisites required.

PUBLIC LECTURES AND EXHIBITIONS.

FRIDAY EVENING PROGRAM

Feb. 24—Microscopic Soiree in cooperation with the State Microscopical Society. Numerous exhibits will be made.

Mar. 3—California COLONEL HOLF

Mar. 17—Yellowstone National Park.....CHARLES TRUAX

Apr. 7—Mountain Climbing in Colorado.....WILLIAM S. COOPER

Apr. 14—Exhibition of Photographic Enlargements..FRANK M. WOODRUFF

Apr. 20—Over the San Juan to the Mesa Verda.....

.....WALLACE W. ATWOOD

May 20—Field Trip.

WOMAN'S CLUB LECTURES.

The Nurses of the city are invited to a course of six lectures to be given at the Chicago Academy of Sciences in Lincoln Park under the auspices of the Social Hygiene Committee of the Phi-

lanthropy Reform Departments of the Chicago Woman's Club. The lectures are free and will occur on successive Fridays at 4 p. m.

- Feb. 3—IntroductionMRS. CHAS. HENROTIN
 Anatomy and PhysiologyDR. ELIZA M. MORSE
 Feb. 10—Embryology and DevelopmentMISS MARY BLOUNT
 Feb. 17—Menstruation and Hygiene of Pregnancy.....
DR. JOSEPHINE E. YOUNG
 Feb. 24—Venereal DiseasesDR. ANNA BLOUNT
 Mar. 3—Marriage and EugenicsDR. RUTH VAIL SNOW
 Mar. 10—Care of Infants and Mrs. Henrotin's Practical Demonstration
 ADA VIRGIL WESCOTT, *Secretary*,
 1360 E. 58th Street.

Chairmen:

MRS. CHAS. HENROTIN
 MRS. P. P. HEYWOOD

The women of the Twenty-third Ward division of the Woman's Club will hold meetings in the Academy lecture room on Wednesdays at three o'clock during the months of February, March and April. The topic of discussion is "Clean Air and Child Welfare."

Announcements will be made early in September for fall work

CLASS WORK AT THE ACADEMY.

The Academy cordially invites teachers to bring their classes to the Academy and offers to provide, whenever possible, and when it is desired by the teacher, someone to assist in conducting the lesson at the museum.

We trust that all classes visiting the museum will register at the office. Arrangements for special class meetings at the museum, should always be made by appointment. This may often be done conveniently by telephone, calling Lincoln 2410 and asking for the Academy office.

ILLUSTRATED LECTURES AT THE SCHOOLS.

The Academy will continue to offer a limited number of illustrated lectures on scientific topics, free of charge, in the public schools. These lectures must be arranged for by special appointment.

MUSEUM LOAN COLLECTIONS.

It is the policy of the Academy to promote in all ways possible the use of the Museum Collections in the public schools. During the coming year the number of collections available will be greatly increased, and those wishing to make use of them may keep posted through correspondence with the Academy. The officers of the Academy are desirous of improving these collections in every way possible, and of adding such new collections as will be used. We hope to prepare additional reading matter to accompany the collections and, if possible, to add photographic illustrations to each collection.

Collections may be retained for one week from date of issue. Birds and other specimens of a fragile or delicate nature must not be handled by the pupils. Only one collection will be issued at one time, but this may be exchanged for another at the expiration of the allotted time. It is expected that the collections will be returned to the Academy in good condition. The following collections, several of which have been fully described in Volume III, Number 3, of the Bulletin, are now ready for use:*

BIRD SERIES.

NO. OF SPECIMENS.

No. B 1.	Winter Residents	6
No. B 2.	Residents	6
No. B 3.	Early Spring Arrivals	6
No. B 4.	Birds of the Great Lakes	3
No. B 5.	Birds of the Air	6
No. B 6.	Summer Residents	6
No. B 7.	Birds of Swamps	6
No. B 8.	Birds of Shores of Lakes.....	5
No. B 9.	Birds of Prey.....	4
No. B10.	Seed-eating Birds	5
No. B11.	Swimming Birds	4
No. B12.	Wading Birds	4
No. B13.	Six Common Birds	6
No. B14.	Grouse and Pigeon	3
No. B15.	Six Migrant Warblers	6
No. B16.	Six Common Woodpeckers	6
No. B17.	Six Common Warblers	6
No. B18.	Six Familiar Birds	6

*It is to be noted that the numbers of the loan collections have been changed. The teachers are requested to indicate the collection desired under the new number.

ZOOLOGICAL SERIES.

No. Z19.	Three Common Fishes	3
No. Z20.	Six Common Mammals	6
No. Z21.	Life History of a Butterfly.....	7
No. Z22.	How Insects Hide	7
No. Z23.	Grasshoppers and Dragon-flies	11
No. Z24.	Ants, Bees and Wasps	9
No. Z25.	Flies	9
No. Z26.	Bugs	9
No. Z27.	Bettles	12
No. Z28.	Lace-winged Insects	4
No. Z29.	Some Common Butterflies	8
No. Z30.	Some Common Moths	5
No. Z31.	Life History of a Beetle.....	10
No. Z32.	The Chambered Nautilus.....	1
No. Z33.	Snails of Field and Forest.....	10
No. Z34.	The Oyster and Its Relatives.....	10
No. Z35.	Beautiful Shells of the Tropics	7
No. Z36.	A Day With the Pond Snails	10
No. Z37.	Odd and Interesting Sea Snails	8
No. Z38.	Star-fishes and Sea Urchins.....	7
No. Z39.	Corals	7
No. Z40.	Sea Fans and Sea Plumes	3

ECONOMIC SERIES.

No. E35.	The Wheat Industry	24
No. E36.	The Wheat Industry	24
No. E37.	The Wheat Industry (Charts).....	2
No. E38.	The Wheat Industry (Charts).....	2
No. E39.	The Featherbone Industry	14
No. E40.	The Featherbone Industry	14
No. E41.	The Pearl Button Industry	7
No. E42.	The Ivory Button Industry	5
No. E43.	Some Common Ores	11
No. E44.	Artificial Abrasives	11
No. E45.	The Iron and Steel Industry	11
No. E46.	Aluminum Ores and Products	7
No. E47.	Coal	5
No. E48.	The Silk Industry	14
No. E49.	The Cotton Industry	11
No. E50.	The Wheat Industry	24
No. E51.	The Wheat Industry. (Charts.).....	2
No. E52.	Some Familiar Commercial Woods.....	18

GEOLOGICAL SERIES.

No. G53.	Eight Common Rocks	8
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IN PREPARATION.

- No. G54. Some common Sedimentary Rocks.
- No. G55. Some common Igneous Rocks.
- No. G56. Some common Metamorphic Rocks.
- No. G57. Fossils of Rock of Chicago Area.
- No. G58. Examples of Weathering.
- No. G59. Crystals of Common Minerals.
- No. G60. Geodes, Concretions, Agates, Nodules, etc.
- No. G61. Some common Soils.

LANTERN SLIDES.

At the urgent request of many, the Academy has undertaken to prepare several sets of lantern slides illustrating natural history and other scientific work conducted in the schools. These sets may be borrowed by a teacher or a principal upon written application. A set of lantern slides may be retained for one week. It is expected that special care will be taken of this material and that it will be returned to the Academy in good condition. The following sets are now ready:

NATURE STUDY.

No. L 1. Resident Birds	13
No. L 2. Winter Birds	12
No. L 3. Migrant Birds	14
No. L 4. Summer Birds	36
No. L 5. Foreign Mammals	19
No. L 6. American Mammals	23
No. L 7. Fresh-water Pearl Button Industry	25
No. L 8. Pearls and Mother-of-pearl	21
No. L 9. Sponges	21
No. L10. Conservation of Forests	12
No. L11. Lower Animals	26
No. L12. Fishes and Reptiles	15
No. L13. Wave Work	14
No. L14. River Work	22
No. L15. Alaska	35
No. L16. Yellowstone Park	36
No. L17. The Coffee Industry	31
No. L18. Rubber and Sisal hemp	25
No. L19. Some Common Trees	29

PICTURE COLLECTIONS.

Many teachers have found pictures, especially stereoscopic views, of special value to them in their work, and in response to many suggestions and requests, the Academy has purchased a

number of sets of stereoscopic views which illustrate topics in Nature Study and Physiography work. A set of views may be borrowed by a teacher or principal upon written application and retained for one week. The following sets of views are now ready for distribution:

SUBJECT.	
PHYSIOGRAPHY.	
	NUMBER OF VIEWS.
No. P 1. Weathering and Stream Erosion.....	25
No. P 2. Glaciers	25
No. P 3. Shore Lines and Harbors.....	25
No. P 4. Mountains	25
NATURE STUDY.	
No. P 5. American and Foreign Mammals.....	30
No. P 6. American and Foreign Birds.....	25
No. P 7. Fruits of Tropical and Temperate Climes.....	30
No. P 8. Domestic Animals	15
ECONOMIC SUBJECTS.	
No. P 9. The Cotton Industry.....	25
No. P10. Iron and Steel Industry.....	35
No. P11. Wheat, Corn and Oats.....	25
No. P12. Lumbering	25
No. P13. Silk Industry	19
No. P14. Copper Mining	13

SUMMER CAMP.

A great deal of interest has been shown among the members of the Academy and among those who are co-operating in the work of the Academy in the establishment of a summer camp. This plan, as it has been provisionally outlined, would involve the selection of some unfenced and little modified region, perhaps in northern Wisconsin or northern Michigan, where the Academy could establish nature-study headquarters for the months of July and August. Tents will be used for shelter and the life conducted as in a real camp. Service will be provided for preparation of the meals and all work associated with that department, but each one will be expected to take care of his or her tent. The Academy will have some one of scientific attainments in charge of the camp, who will be conducting work of collecting or study and will render such assistance as he can to others. No distinct courses of instruction will be offered. The whole life should be such as to be profitable as well as recreative to those coming

to live at the camp. The camp would not be conducted for financial profit, but those enjoying the privileges offered would share equally in meeting the expenses. It is anticipated that by such an arrangement the expenses would be reduced to at least six dollars a week.

As arrangements for such a camp must be made long in advance, and as certain boards in the Academy must approve the plans, it is important that we know at as early a date as is possible the probable number who will desire accommodations at the camp.

MEMBERSHIP.

The Academy has now undertaken active educational work which is especially effective on the North Side. Heretofore, membership has been practically limited to persons especially interested in science or in the promotion of scientific work. The Academy will continue to carry on scientific research and encourage, as far as possible, progress along these lines, but a portion of the resources of the Academy and the efforts of the officers of the institution are now being directed toward adapting scientific knowledge and museum collections to distinctively educational work. The institution has, therefore, become one in which all persons interested in the educational welfare of the city should become identified. The Academy conducts numerous courses of instruction and co-operates with the public and private educational work of the city as far as its resources permit.

Membership in the Academy is open to "any person residing in Chicago or vicinity who is in sympathy with the objects of the Academy." The Active Members constitute the governing body in the Academy and pay annual dues of Five Dollars each. Associate Members have all the privileges of Active Members except those of voting and holding office. Their dues are Three Dollars a year. A copy of each of the publications issued by the Academy is sent to all paid-up members. Special lecture and guest tickets are also issued to members.

Application blanks may be secured from the Secretary, who will be pleased to confer with any who may become so interested

in the work of the Academy that they would like to become more directly associated with it.

WALLACE W. ATWOOD, *Secretary of the Academy*,
Lincoln Park, Chicago.

NEEDS OF THE ACADEMY.

It is perhaps apparent to one reading this report with care, that the institution has outgrown its present quarters and that the demands upon it and the opportunities open to it indicate that the additional building which was originally planned for the institution should be erected. We need in the new building an auditorium with a seating capacity of five to eight hundred where various meetings and lectures may be held. Class rooms, laboratories and children's work rooms in which courses of instruction may be conducted, should also be provided. A children's museum should be placed in this additional space. These needs require additional endowment as well as additional funds for the construction of the new building, and the officers of the Academy will be pleased to confer with any to whom these needs appeal and who may wish to co-operate in building up a strong educational institution on the North Side which, as a quasi-public institution, shall assist in the general cultural development of this part of the city.

THE BED ROCK TOPOGRAPHY BENEATH CHICAGO.

For several years the Academy has been collecting data on the depth of the bed rock in the various portions of the city. It is proposed now to plot all the data that becomes available, upon a map of the city and neighboring districts, and later to prepare, if sufficient data is received, a contour map showing the topography of the underlying rock surface. Latter a relief model of the underlying rock surface may be prepared. The city officials, Sanitary Board, the Chicago Telephone Company, several of the architects and contractors in the city have indicated their willingness to co-operate with us in this work by furnishing data. The Academy will appreciate any other assistance that may be offered in the gathering of such statistics.

No. VII. *Some Points on the Micro-Chemistry of Fats*. By John H. Long, Sc.D. Price, 25 cents.

No. VIII. *Chicago Artesian Wells. On Their Structure and Sources of Supply*. By Leander Stone, A.M. Price, 25 cents.

No. IX. *On Rhizocarps in the Erian (Devonian) Period in America*. By Sir William Dawson, LL.D., F.R.S. Price, 25 cents.

No. X. *A Paper on Elephas Primigenius*. By William K. Higley. Price, 25 cents.

Bulletins, Volume II.

No. I. *The Flora of Cook County, Illinois, and a part of Lake County, Indiana*. By William K. Higley and Charles S. Raddin. Out of print.

No. II. *Preliminary Outline of a New Classification of the Family Muricidae*. By Frank Collins Baker, Curator. Price, 25 cents.

No. III. *The Gross Anatomy of Limnæa Emarginata Say, Var. Michelsoni Emme*. By Frank Collins Baker, Curator. Price, 50 cents.

No. IV. (1) *The Digitations of the Mantle in Physa*. (2) *Description of a New Species of Limnæa*. By Frank Collins Baker, Curator. Price, 25 cents.

Bulletins, Volume III.

No. I. *Annual Report, 1908*. Price, 25 cents.

No. II. *Report on proposed Educational Work of the Chicago Academy of Sciences*. Price, 25 cents.

Special Publications:

No. I. *Historical Sketch of The Chicago Academy of Sciences (1856-1902)*. By William Kerr Higley, Secretary of the Academy. Limited distribution.

No. II. *The Chicago Academy of Sciences: Its Past History and Present Collections*. Price, 10 cents.

Annual Reports:

Only four have been printed.

1872. *Annual Address*, by E. W. Blatchford, A.M.

1895. *Thirty-Eighth Annual Report*.

1896. *Thirty-Ninth Annual Report*.

1897. *Fortieth Annual Report*.

II. *By the Natural History Survey:*

Bulletin No. I. The Lichen-Flora of Chicago and Vicinity. By William Wiet Calkins. Price, 25 cents.

Bulletin No. II. The Pleistocene Features and Deposits of the Chicago Area. By Frank Leverett, U. S. Geol. Survey. Price, 50 cents.

Bulletin No. III. The Mollusca of the Chicago Area. Part I, The Pelecypoda. Part II, The Gastropoda. By Frank Collins Baker, Curator of The Chicago Academy of Sciences. Price, Part I, \$1.00; Part II, \$1.00.

Bulletin No. IV. The Paleontology of the Niagara Limestone in the Chicago Area. Part I, The Crinoides. Part II, Trilobites. By Stuart Weller of the University of Chicago. Price, 75 cents each.

Bulletin No. V. The Mineralogy of the Chicago Area. By Alja Robinson Crook of the Northwestern University. Price, 50 cents.

Bulletin No. VI. The Birds of the Chicago Area. By Frank Morley Woodruff. Price, \$1.00.

Bulletin No. VII. *The Higher Fungi of the Chicago Region.* Part I, The Hymenomycetes. By Dr. Will Sayer Moffatt. Price, \$1.00.

In Preparation:

a. Boring Records of Chicago and Vicinity. By Dr. Wallace W. Atwood.

b. Paleontology. (Subsequent parts.) By Professor Stuart Weller.

c. Lepidoptera. By William L. Tower.

d. Reptilia and Batrachia. By Dr. Seth E. Meek.

e. Algæ. By Professor C. B. Atwell.

f. Pteridophyta and Bryophyta. By Professor E. J. Hill.

g. Flora of Cook County and Vicinity. (Phænogamia.) By Dr. H. S. Pepon.

h. Ethnology and Archæology. By Dr. William A. Phillips.

i. Fishes. By Dr. Seth E. Meek.

j. Noxious Insects.

k. Composition of the Waters of the Deep Wells of the Chicago Area. By Dr. John H. Long.

l. The Niagara Formation. In charge of Dr. Thomas C. Chamberlin. Memoir.

m. The Lymnæidæ of North and Middle America. By Frank Collins Baker. Price \$5.00.